

Xiuwei Xu

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Education

Department of Automation, Tsinghua University

PhD in Control Science and Engineering

Advisor: Prof. Jiwen Lu

Beijing, China

2021-

Department of Automation, Tsinghua University

B.S. in Automation

Beijing, China

2017-2021

Experience

BOSCH China

Intern in Autonomous Driving Department

Engineer topic: multi-task scene understanding, semi-supervised object detection.

Shanghai, China

2023

Cambricon

Intern in Intelligent Processor Research Center

Engineer topic: CNN acceleration and deployment on microserver with C-based language.

Beijing, China

2020

Research Interests

My research interest is 3D vision and robotics. In particular, I am interested in 3D scene understanding and its application in embodied tasks like navigation and manipulation. I believe embodied intelligence will reshape the society and benefit our lives. My long-term goal is to construct general embodied agents with the ability to perceive, plan and act in 3D space.

Publications

* Equal contribution, † Project leader.

First-Authored Top Conference/Journal

- [1] Hang Yin*, **Xiuwei Xu***†, Linqing Zhao, Ziwei Wang, Jie Zhou, Jiwen Lu
UniGoal: Towards Universal Zero-shot Goal-oriented Navigation
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025
- [2] Wenxuan Guo*, **Xiuwei Xu***, Ziwei Wang, Jianjiang Feng, Jie Zhou, Jiwen Lu
Text-guided Sparse Voxel Pruning for Efficient 3D Visual Grounding
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, **Highlight**), 2025
- [3] **Xiuwei Xu**, Huangxing Chen, Linqing Zhao, Ziwei Wang, Jie Zhou and Jiwen Lu
EmbodiedSAM: Online Segment Any 3D Thing in Real Time
The Thirteenth International Conference on Learning Representations (ICLR, **Oral**), 2025
- [4] Hang Yin*, **Xiuwei Xu***†, Zhenyu Wu, Jie Zhou, Jiwen Lu
SG-Nav: Online 3D Scene Graph Prompting for LLM-based Zero-shot Object Navigation
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2024
- [5] **Xiuwei Xu***, Zhihao Sun*, Ziwei Wang, Hongmin Liu, Jie Zhou, Jiwen Lu
3D Small Object Detection with Dynamic Spatial Pruning
European Conference on Computer Vision (ECCV), 2024
- [6] **Xiuwei Xu**, Ziwei Wang, Jie Zhou, Jiwen Lu
Back to Reality: Learning Data-Efficient 3D Object Detector with Shape Guidance
IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2024

- [7] **Xiuwei Xu***, Chong Xia*, Ziwei Wang, Linqing Zhao, Yueqi Duan, Jie Zhou, Jiwen Lu
Memory-based Adapters for Online 3D Scene Perception
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024
- [8] **Xiuwei Xu**, Ziwei Wang, Jie Zhou, Jiwen Lu
Binarizing Sparse Convolutional Networks for Efficient Point Cloud Analysis
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023
- [9] **Xiuwei Xu**, Yifan Wang, Yu Zheng, Yongming Rao, Jie Zhou, Jiwen Lu
Back to Reality: Weakly-supervised 3D Object Detection with Shape-guided Label Enhancement
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022

Peer-Reviewed Conference Publications

- [10] Zhenyu Wu, Yuheng Zhou, **Xiuwei Xu**, Ziwei Wang, Haibin Yan
MoManipVLA: Transferring Vision-language-action Models for General Mobile Manipulation
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025
- [11] Yinan Liang, Ziwei Wang, **Xiuwei Xu**, Jie Zhou, Jiwen Lu
EfficientLLaVA: Generalizable Auto-Pruning for Large Vision-language Models
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025
- [12] Changyuan Wang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu
Q-VLM: Post-training Quantization for Large Vision-Language Models
Thirty-eighth Conference on Neural Information Processing Systems (NeurIPS), 2024
- [13] Changyuan Wang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu
Towards Accurate Post-training Quantization for Diffusion Models
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, **Highlight**), 2024
- [14] Linqing Zhao, **Xiuwei Xu**, Ziwei Wang, Yunpeng Zhang, Borui Zhang, Wenzhao Zheng, Dalong Du, Jie Zhou and Jiwen Lu
LowRankOcc: Tensor Decomposition and Low-Rank Recovery for Vision-based 3D Semantic Occupancy Prediction
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024
- [15] Yinan Liang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu
MCUFormer: Deploying Vision Transformers on Microcontrollers with Limited Memory
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023

Peer-Reviewed Journal Publications

- [16] Ziwei Wang, Changyuan Wang, **Xiuwei Xu**, Jie Zhou and Jiwen Lu
Quantformer: Learning Extremely Low-precision Vision Transformers
IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2023
- [17] Yu Zheng, **Xiuwei Xu**, Jie Zhou and Jiwen Lu
PointRas: Uncertainty-Aware Multi-Resolution Learning for Point Cloud Segmentation
IEEE Transactions on Image Processing (T-IP), 2022

Honors and Awards

○ NSFC Youth Student Research Grant (PhD)	2024
○ Chinese National Scholarship	2024
○ Outstanding Graduate of Beijing	2021
○ Innovation Award of Science and Technology, Tsinghua University	2020
○ Innovation Award of Science and Technology, Tsinghua University	2019

Teaching Experience

Department of Automation, Tsinghua University Teaching assistant for Computer Vision	Beijing, China 2024-2025
Department of Automation, Tsinghua University Teaching assistant for Pattern Recognition and Machine Learning	Beijing, China 2022-2023
Department of Automation, Tsinghua University Teaching assistant for Numerical Analysis	Beijing, China 2021

Academic Services

Conference Reviewer

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2025)
- Neural Information Processing Systems (NeurIPS 2024-2025)
- IEEE/CVF International Conference on Computer Vision (ICCV 2023, 2025)
- European Conference on Computer Vision (ECCV 2024)
- International Conference on Machine Learning (ICML 2025)
- International Conference on Representation Learning (ICLR 2025)

Journal Reviewer

- International Journal of Computer Vision (IJCV)
- IEEE Transactions on Image Processing (T-IP)
- IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)
- IEEE Transactions on Multimedia (T-MM)
- IEEE Transactions on Intelligent Transportation Systems (T-ITS)